TITLE

~~METHOD FOR STORING SEARCH FEATURES OF AN IMAGE SEQUENCE~~

BACKGROUND OF THE INVENTION

The present invention relates to a method for storing search features of an image sequence and

5   to an accessing of the image sequence with the aid of the search features.

Today, audiovisual information (image sequences) of all kinds is stored in digitized

form at various locations. In order to use this audiovisual information, it is necessary

to find the relevant data first.

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The MPEG standards of image compression have long been known to the person

skilled in the art.

A   First, to define specific terms used herein: An ~~image sequence~~ image sequence designates a series of

15 A related images. An ~~image scene~~ image scene is a real subset of an image sequence and is initiated

A   by an ~~intraimage~~ intra image that is defined in MPEG or ITU, ~~respectively~~.

SUMMARY OF THE INVENTION

It is an object of the present invention to provide

~~The object of the invention is to set forth~~ a method for storing search features of an

image sequence/image scene and to make it possible to access this image

20   sequence/image scene via these search features.

A   ~~This object is achieved according to the features of patent claim 1.~~
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A   The present method makes it possible to store search features of an image sequence and to

25   access the image sequence with the aid of the search features, said search features

being determined from the image sequence. The search features are stored together

with the image sequence. The image sequence is accessed in the event that a

predetermined item of information is contained in the search features.

In an embodiment

A ~~A development of the invention consists in~~ the search features ~~being~~ *are* audio data and/or video data of the image sequence.

In an embodiment

A ~~Another development consists in the ability to access~~ an image within the image sequence *can be accessed* with the aid of the search features, which in turn contain a reference (a pointer) on their part.

The access can be accomplished in that the reference is offset in time within the image sequence and thereby references the image. Access to the image is thus guaranteed. The reference addresses the image and with this a beginning within the image sequence.

In an embodiment

A ~~In a further development~~, it is possible to prefix search features to the image sequence, to append them to one end of the image sequence, or to store them within the image sequence. This is preferably accomplished with the aid of an ~~intraimage~~ *intra-image* that is defined in MPEG or ITU, which initiates an image scene and to which the search features can be prefixed. Several image scenes with a respective ~~intraimage~~ *intra-image* can be contained within the image sequence.

In an embodiment

~~Another development consists in storing~~ each individual image scene *is stored* in a database, ~~and~~ thus guaranteeing access to the image scene.

In an embodiment

~~An additional development consists in storing~~ separate search features *are stored* in the image sequence for individual objects that are defined according to the MPEG or ITU standard, ~~respectively~~. It is possible in this way to offer entry points that are related to such objects and linked to the search features.

Another development consists in unambiguously identifying the search features using ~~a predetermined start code (header).~~

Since the search features are stored together with the image sequence, a

comprehensive image database can be compiled from individual image sequences

such as this. On the other hand, a global, preferably external, reference list containing

the search features and corresponding references to the image sequence complicates a

5   modular construction of the image sequence (above all when this consists of several

image sequences that are to be exported to other databases individually).

Further developments of the invention also derive from the dependent claims.

10   ~~Exemplifying embodiments of the invention are detailed with the aid of the Figures.~~
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~~Shown are:~~

~~Figure 1   a block diagram illustrating a method for storing search features of an~~

~~image sequence and illustrating an accessing of the image sequence~~ with

15   ~~the aid of the search features,~~

~~Figure 2   various possibilities for the common storing of search features with the~~

~~image sequence,~~

~~Figure 3   a sketch illustrating the search features and appertaining references that~~

~~dereference [sic] the image data.~~

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In step 1a of Figure 1, search features are determined from the image sequence. To

this end, images are sought that correspond to a given pattern image completely or in

parts. This is achieved in that the pattern image is first analyzed with respect to

predetermined features, particularly the predominant color or typical shapes that

25   occur. These features are stored in a database and referenced with a pointer indicating

the image material that is to be referenced; that is, the found pattern image within the

image sequence. The search features are stored together with the image sequence in a

step 1b. Finally, it becomes possible to access the image sequence with the aid of the

search features in a step 1c in that a predeterminable feature is compared to the search

A features, and, if agreement ~~was found [sic]~~ *is found*, the procedure skips to the image sequence within the image sequence referenced by the search features.

It should be noted that it is not only possible to reference video data, exclusively, but
5 that pointers indicating audio data can also be stored just as well.

In Figure 2 various possibilities for storing search features together with the image sequence are illustrated.

10 Figure 2a depicts an image sequence GOP (Group of Pictures, as defined in MPEG standards), containing a header H and image information BE. A time axis t running vertically from the top down applies to all Figures 2a to 2b. This indicates that the time characteristic is a time characteristic of an image series that is stored as an image sequence.

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In Figure 2a search features M are prefixed to the image sequence GOP. The search features M are preferably stored in a form that can be read easily as a list in plaintext (ASCII code). Long lists of search features can also be stored compressed. A pointer PTR indicating an image in the image sequence is connected to each individual search
20 feature, whereby this image indicates the beginning of an image series within the image sequence, which series is linked to the search feature.

In Figures 2a to 2d such references (pointers) are represented as arrows PTR.

25 In Figure 2b, the search features M are affixed behind the image sequence GOP. Otherwise the same applies here as in Figure 2a.

As illustrated in Figure 2c, the search features M can be stored within an image sequence GOP. Accordingly, references PTR that are linked to the search features M

must refer to image information before the search features M (above the search features M in Figure 2c) or to image information after the search features M (below the search features in Figure 2c) in terms of time.

5   Finally, Figure 2d depicts the coding of individual objects (audio objects and/or video objects) that is possible according to the MPEG or ITU standards, respectively. For this purpose, separate search feature sets M31 and M32 to each object 01 and 02 are supplemented [sic] An audiovisual scene can contain several sets of search features M1, M2, M31 and M32.

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In Figure 2d the search feature sets M1 and M2 relate to image data BD generally, whereas the search feature sets M31 and M32 respectively contain search features, whose entries (references) within the image series which are divided according to objects 01 and 02 refer to corresponding locations that are to be referenced.

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Figure 3 depicts an organization of a list of search features and their relation to the image data BD. The vertical course of a time axis t from the top down again applies. The search features M in the form of a list are prefixed to the image sequence GOP containing the header H and the image data BD. The list contains several search

20   features SM1 and SM2. Each search feature respectively comprises a descriptive component INFO1 and INFO2 and a respective reference (pointer) PTR1 and PTR2 indicating an image within the image data BD.

As described above, for an image sequence that is compressed according to the MPEG

25   standard, the list can be logically subdivided so that specific search features S_{mi} result with respect to predeterminable objects within the image sequence that is compressed according to the MPEG standard. [sic] To differentiate two objects, every second search feature SM_{2i} is allocated to a first object, and the other search feature $SM_{(2i+1)}$ is

allocated to a second object (i=0,1,2,3,..). Accordingly, different search feature sets

can be created for several objects within the same image sequence.

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